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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 2002	
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense-Wide/BA 3							R-1 ITEM NOMENCLATURE Joint Warfighting PE 0603727D8Z		
COST <i>(In Millions)</i>	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Cost
Total Program Element (PE) Cost	7.538	7.536	9.610	9.867	10.156	10.534	10.819	Continuing	Continuing
Joint Warfighting/P727	7.538	7.536	9.610	9.867	10.156	10.534	10.819	Continuing	Continuing

(U) **A. Mission Description and Budget Item Justification**(U) **BRIEF DESCRIPTION OF ELEMENT:**

(U) In May 1998 the Secretary of Defense appointed Commander-in-Chief, United States Joint Forces Command (formerly the US Atlantic Command), as the Defense Department's Executive Agent for Joint Experimentation. Subsequently, the Department realigned resources to support the Joint Forces Command's new role. In FY 1999 funds from this Program Element were redirected to support the initial stand-up of Joint Forces Command's Joint Experimentation Directorate. Funding for joint experiments was transferred to Joint Forces Command through the Navy. Funding to support the Joint Advanced Warfighting Program (JAWP) concept development, the Information Technology Backplane (ITB), and Technology Feeder Support (TFS) for joint experimentation was retained in this PE. Program Element 0603727N was established to provide Joint Forces Command with its own funding source in FY 2000.

(U) The Joint Warfighting PE supports three related activities: the JAWP, the ITB, and TFS for Joint Experimentation. While these activities strongly support Joint Forces Command's joint experimentation efforts, a separate program element has been retained since the activities support other organizations in addition to Joint Forces Command, and they require a degree of independence from Joint Forces Command to function as envisioned.

(U) The JAWP was established by the Office of the Secretary of Defense (OSD), with the support of the Vice Chairman of the Joint Chiefs, to serve as a catalyst for innovation and change. This program's focus is on assisting in the formulation and assessment of advanced concepts and capabilities, plus identifying enabling technologies and integration options for the Department. These concepts drive changes in the doctrine, organization, training and education, materiel, leadership and facilities (DOTMLF) of the Services. The JAWP serves a key role in identifying, exploring and evaluating breakthrough warfighting capabilities. It builds on the lessons learned from earlier Service experiments that have underscored the importance of having a firm conceptual basis upon which to build experiments. The JAWP concentrates on joint, vice Service-unique, revolutionary concepts. In identifying and elaborating innovative joint concepts and capabilities, and associated enabling technologies, the JAWP will not only take into account Service efforts, but those of CINCs and Defense agencies as well. The JAWP promotes integration, conducts experiments and assists in implementation. The JAWP's work complements and supports the activities of Joint Forces Command, the Joint Staff and the OSD. It provides an independent source for formulating advanced concept candidates for joint experimentation.

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The JAWP is composed of both civilian analysts and technologists. The JAWP Analytical Project Office (JAWP-APO), a jointly manned activity established by the Deputy Secretary of Defense, consists of military personnel from the four Services. The civilians provide a level and quality of expertise not generally available in the Department of Defense. The active duty military members provide a current operational perspective to concepts under investigation and serve as a vital link to ongoing relevant activities in the Services.

(U) The ITB provides an advanced network infrastructure that extends commercial capabilities to provide capabilities needed to meet JV2020 needs. Information Superiority is a key JV2020 building block and the ITB provides the means to experiment with the digital transmission capabilities that will be available in five years. The ITB is not a new physical network. It is a virtual network that capitalizes on existing physical networks such as the Defense Information Systems Network (DISN), the Defense Information Systems Agency (DISA) - Defense Advanced Research Projects Agency (DARPA) Leading Edge Services Network (DISN-LES), the Defense Research and Engineering Network (DREN), and the experimental Advanced Technology Demonstration Network (ATDnet). The ITB has many users from sites served by existing networks, but the funding included in this PE is the incremental funding needed to support joint experimentation. For example, this PE provides the circuit costs to extend the ITB from the experimentation site to the nearest point on the backplane (where no other network exists), and only the “extra” backplane costs generated by the Joint Warfighting Experiments. Since joint experiments are very dependent on advanced distributed simulation, or on limited, live, command post exercises that are being driven by simulations, a robust network is needed to interconnect the various sites. These simulations press the state of the art in networking capability, including that of requiring high-bandwidth, low-latency Type-I encryption for protected communications. The ITB also supports new bandwidth-intensive applications such as video teleconferencing and high definition television.

(U) The third effort supported by this PE is TFS for joint experiments. There are many Technology Demonstrations (TDs), Advanced Technology Demonstrations (ATDs), and Advanced Concept Technology Demonstrations (ACTDs) that can provide advanced technologies to support joint experiments. For example, the Joint Staff has prepared 72 desired operational capabilities based on JV2020 concepts and 21st Century Challenges. For each Challenge, the Joint Staff has prepared roadmaps that provide opportunities to assess each Challenge. The roadmap for the battlefield awareness challenge shows 42 ACTDs that have the potential to demonstrate some aspect of a desired operational capability supporting battlefield awareness. This effort provides technology managers the resources to expand the scope of a test or demonstration to collect data for the joint staff or JFCOM, thereby leveraging the OSD and Service ACTD investment. The Technology Feeder Support effort is also being used to initiate a Red Team Pilot Project (DoD Adaptive Red Team – DART) for Joint Forces Command. The DART will participate in Joint Forces Command Concept Development and Experimentation to provide an independent assessment that will ensure that product quality stays high and credible. This source of funding, which is separate from other Joint Forces Experimentation funding, will provide the necessary independence.

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(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

(U) FY 2001 Accomplishments:

(U) The Joint Advanced Warfighting Program (JAWP) continued its support of joint concept development and experimentation for the Office of the Secretary of Defense, the Joint Staff, Joint Forces Command, and DARPA. Building on its FY 98 through FY 00 experiences, JAWP focused on enhancing joint operational-level command and control, ISR integration, and joint force application. To help evolve Joint Forces Command's Rapid Decisive Operations concept and support DARPA's and the Army's Future Combat Systems (FCS) development effort, JAWP planned, developed partnerships, coordinated, and initiated the Future Joint Force I Experiment, investigating innovative command and control applications, integration of theater and tactical ISR efforts, and employment of robust air and ground robotic sensor suites using wargames, constructive modeling, and human-in-the-loop simulation. This effort is a partnership that engaged the Army and Air National Guard, the UK, Canada, the Marine Corps Warfighting Lab, the Army's Mounted Maneuver Battle Lab (MMBL), IDA, RAND, and DARPA. This extensive partnering effort recognizes that transformation requires a common perspective on challenges and solutions, including the perspectives of allies. In support of the Joint Staff, JAWP developed a definition and operational framework for effects-based operations and developed a draft joint operational concept for dominant maneuver. Included in all of JAWP's work are vulnerability assessments using "Red Teaming" techniques that identify weaknesses and help avoid surprises. In support of OSD and the Joint Staff, JAWP completed development of a DoD Roadmap for Urban Operations. JAWP's outreach efforts have engaged: Israel and the UK in effects-based planning and operations; all NATO partners in urban warfare concept development; the UK, Australia, and Canada in joint concept development and experimentation; and Germany and Singapore in possible future participation in joint experimentation. In support of Joint Forces Command, JAWP planned, coordinated, and initiated cooperation with the Warrior Prep Center at Ramstein, Germany to support concept development efforts with the Multinational Interoperability Council nations—Britain, France, Germany, Canada, and Australia. Finally, JAWP supported the Secretary of Defense's Transformation Panel with briefings and concept papers that resulted in recommendations included in the current Defense Planning Guidance. (\$4.500 Million)

(U) The ITB support for wide-area network connectivity for joint warfighting experimentation continued, as did the ongoing task of transitioning emerging technology from advanced research network testbeds. Specifically, Unified Vision 01 was supported and executed, while assistance was given to design Millennium Challenge 02. The Future Combat System (FCS) series of experiments linking JFCOM with the MMBL at Ft. Knox was supported using the DREN. Initial implementation of secure (Kerberized) network management protocols (SNMPv3) across selected ITB sites was demonstrated. Development and evaluation of advanced security/information assurance devices and tools, such as ATM and host-based layered firewall technologies, was begun in the lab. Distributed applications, such as collaborative tools, continued. Commercialization of IP Class-of-Service (CoS) to ATM Quality-of-Service was furthered with initial testing

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of Class-Based, Weighted Fair Queuing (CBWFQ). Efforts in support of JFCOM continued. Connectivity to key sites (JFCOM, SPAWAR, WISSARD, etc.) continued, with selected circuits upgraded as required. Significant hardware upgrades to end-sites occurred. (\$1.400 Million)

(U) Technology Feeder Support: JFCOM's Campaign Plan 01 identified 31 major exercises and experiments in FY 2001. The Deputy Under Secretary of Defense (Advanced Systems and Concepts), in coordination with JFCOM and the Joint Staff, assisted in determining which ACTDs, ATDs, and/or Technology Demonstrations best support JFCOM's experimentation events. Funding was provided to the selected technology managers to support a joint experiment. Funding was provided for efforts such as system integration, and logistics and test support. Planning and preparations continued for incorporation of as many technology demonstrations as possible into the primary FY 2002 joint experiment, MILLENNIUM CHALLENGE 2002. Initial funding was provided to the (DART) which evaluated the major joint experiment of 2001 (Unified Vision 01) and prepared to observe and critique MILLENNIUM CHALLENGE 2002. (\$1.638 million)

(U) FY 2002 Plans:

(U) The JAWP will continue its Future Joint Force Experiment, building toward FY 04 completion of the Rapid Decisive Operations (RDO) series of human-in-the-loop simulation experiments. The effort will incorporate insights from JAWP's Future Joint Force I experiment and Joint Forces Command's Unified Vision 01 experiment to build the foundations for a beyond 2010 forcible entry operations capability addressing a broad range of potential contingency environments. The experiment will leverage the results of past JAWP and JFCOM experiments to exploit networked ISR capabilities as an integrated tool of warfare; refine joint command and control organization; integrate manned and unmanned capabilities for reconnaissance and combat applications; and explore innovative ways to overcome opponents' protective measures. Opportunities will be identified to leverage and integrate Service, allied, and other agency programs. Through workshops and limited objective experiments, JAWP will also help integrate the independent joint command and control initiatives of PACOM, CENTCOM, JFCOM, and Service command and control capabilities to help attain the Secretary's objective of establishing a more standardized and responsive joint command and control structure worldwide. Data collection and independent analysis will be conducted and used to produce reports and papers intended to inform the OSD, Joint Staff and the Joint Forces Command leadership of experimentation results and to inform transformation choices. Vulnerability assessments and "Red Teaming" will be conducted to improve the validity and robustness of experimentation. The JAWP will help identify and exploit opportunities facilitating the early transition of new concepts and technologies to operational capabilities. (\$4.500 Million)

(U) The ITB support for wide-area network connectivity for joint warfighting experimentation will continue, as will the ongoing task of transitioning emerging technology from advanced research network testbeds. Specifically, FCS support will continue and Spiral 01, Spiral 02 and Millennium Challenge 02 will be supported and executed. More robust versions of CBWFQ will be implemented to map IP CoS to ATM QoS. Implementation of secure (Kerberized) network

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management protocols (SNMPv3) across the major ITB sites is expected. Information assurance and other security technologies will continue to be tested and deployed, including determining the effectiveness of next-generation Type-1 cryptographic devices on distributed simulation. Initial testing and deployment of high-quality, low-latency, host-based video teleconferencing and collaborative tools will begin. Efforts in support of JFCOM will continue. Connectivity to key sites (JFCOM, SPAWAR, WISSARD, etc.) will continue with selected circuits and equipment upgraded as required. (\$1.400 Million)

(U) Technology Feeder Support for Joint Experimentation will continue. JFCOM's Campaign Plan 01 projects 26 major exercise and experiments which can support technology demonstrations. The primary FY 02 effort will be Millennium Challenge 02 and the TFS effort will enable the incorporation of numerous technology demonstrations. Plans for Olympic Challenge 04 will be further defined and work will begin to align the technologies supporting this major integrating exercise. Integrated concept teams (ICTs) will have had the opportunity to prepare more detailed experimentation and assessment plans. Once the concepts and experimentation plans are more clearly articulated, technologies supporting the experiments will be identified. This funding will leverage ongoing developments to support joint experiments, not to fund the development itself. The DOD Adaptive Red Team (DART) Pilot Project will initially be funded from within this project. Its primary focus will be to evaluate Millennium Challenge 02. (\$1.636 million)

(U) FY 2003 Plans:

(U) The Joint Advanced Warfighting Program (JAWP) will continue support of the Department's transformation objectives through joint experimentation and joint concept development. Specifically, the JAWP will continue its Future Joint Force experiment to exploit insights gained from FY01 and FY02 experimentation and JFCOM's Millennium Challenge 02 limited objective experiments. It will also help identify an implementation path for a worldwide joint command and control structure emphasizing the creation of standing Joint Task Forces as the foundation on which future joint operations will be based. (\$4.500 Million)

(U) The ITB support for wide-area network connectivity for joint warfighting experimentation will continue, as will the ongoing task of transitioning emerging technology from advanced research network testbeds. Information assurance and other security technologies will continue to be tested and deployed. Deployment of high-quality, low-latency, host-based video teleconferencing and collaborative tools will continue. Support for Olympic Challenge 04 planning will be provided. Efforts in support of JFCOM will continue. Connectivity to key sites will continue with selected circuits and equipment upgraded as required. (\$1.400 Million)

(U) Technology Feeder Support for Joint Experimentation will continue. Further determination of potential major exercises and experiments which can support technology demonstrations will be completed. Plans for Olympic Challenge 04 will be further defined and work will continue to align the technologies supporting this major integrating exercise. ICTs will continue to complete detailed experimentation and assessment plans. Technologies to support selected experiments will

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be further identified. An expanded DOD Adaptive Red Team (DART) will be used to support a number of selected major exercises to enhance the evaluation. of Joint Experimentation. (\$3.710 million)

(U) <u>B. Program Change Summary</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>Total Cost</u>
President's FY 2001 Budget Submission	7.607	7.570	7.588	Continuing
Delta	(0.069)	0.043	3.060	
FY 02 Amended President's Budget Submission	7.538	7.613	10.648	
Appropriated Value	7.607	7.613		Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed Undistributed Reduction	0.000	-0.077	0.000	
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	-0.069	0.000	0.000	
c. Other	0.000	0.000	-1.038	
Current President's Budget	7.538	7.536	9.610	Continuing

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Change Summary Explanation:

- (U) **Funding:** FY 2001 reduction reflects Section 8086 adjustments.
FY 2003 funding increase reflects an expanded DoD Adaptive Readiness Team (RED TEAM) effort.
- (U) **Schedule:** N/A
- (U) **Technical:** N/A
- (U) **C. Other Program Funding Summary Cost:** N/A
- (U) **D. Acquisition Strategy:** N/A
- (U) **E. Schedule Profile:** N/A

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